

Customer No.: 31561  
Docket No.: 10731-US-PA  
Application No.: 10/708,801

**To the claims**

Claims 1-4. **Cancelled.**

5. (Currently amended) A method of preparing a zirconia sol, comprising:  
providing a first solution containing an inorganic zirconium salt and an organic acid therein, wherein the organic acid is propionic acid, acrylic acid, or methacrylic acid;  
mixing the first solution with a buffer solution containing an organic amine therein for obtaining a sol, wherein the organic amine is trimethanolamine, triethanolamine or tripropanolamine;  
heating the sol to obtain a product;  
adjusting the pH of~~conditioning~~ the product to form an acidic slurry, wherein the acidic slurry has a pH value less than 3-~~and~~; and  
adjusting the pH of the acidic slurry~~conditioning the acid-~~and~~~~ to form a neutral zirconia sol having a pH value between 5~10.

6. (original) The method according to claim 5, wherein after the step of mixing the first solution with the buffer solution, further comprising regulating the pH value of the sol between 10 ~12.

7. (original) The method according to claim 5, wherein during the step of mixing the first solution with the buffer solution, further comprising a step of adding an inorganic base into the buffer solution.

8. (original) The method according to claim 7, wherein when mixing the first solution with the buffer solution and adding the inorganic base into the buffer solution,

Customer No.: 31561  
Docket No.: 10731-US-PA  
Application No.: 10/708,801

further comprising controlling the variation of the pH value of the buffer solution not exceeding a variation range of  $\pm 0.5$ .

9. (Currently amended) The method according to claim 8, wherein the step of controlling the pH value of the buffer solution comprises controlling the addition rates~~adding speeds~~ of the first solution and the inorganic base into the buffer solution.

10. (original) The method according to claim 5, wherein when mixing the first solution with the buffer solution, further comprising controlling the temperature variation of the buffer solution not exceeding a variation range of  $\pm 10^{\circ}\text{C}$ .

11. (original) The method according to claim 5, wherein an amount of the inorganic zirconium salt in the first solution is between 2~4 mol/L.

12. (Currently amended) The method according to claim 5, wherein the inorganic zirconium salt in the first solution is ~~selected from one of~~ zirconium chloride, zirconium nitrate or zirconyl hydrochloride~~nitride and zirconium hypochloride~~.

13. (original) The method according to claim 5, wherein the organic acid and the zirconium ions in the first solution have a molar ratio between 0.1~0.25.

**Claim 14. Cancelled.**

15. (original) The method according to claim 5, the buffer solution contains ammonium carbonate.

**Claim 16. Cancelled.**

17. (original) The method according to claim 5, wherein the organic amine in the buffer solution and the zirconium ions in the first solution have a molar ratio between 0.1~0.2.

Customer No.: 31561  
Docket No.: 10731-US-PA  
Application No.: 10/708,801

18. (original) The method according to claim 5, wherein the step of heating the sol is conducted under 90~120°C.

19. (original) The method according to claim 5, wherein the step of heating the sol is conducted for a duration of about 8~24 hours.

20. (original) The method according to claim 5, wherein the product obtained after heating the sol comprises zirconia crystals having an average primary particles size less than 20 nm.

21. (original) The method according to claim 20, wherein the zirconia crystals have an average primary particles size between 7~20 nm.

22. (original) The method according to claim 20, wherein the zirconia crystals exist in combined tetragonal and cubic crystal lattice structures.

23. (original) The method according to claim 5, wherein after the step of heating the sol, further comprising the steps of washing and filtering the product.

Claims 24-27. **Cancelled.**

28. (Currently amended) The method according to claim 5, wherein after the step of ~~conditioning the acid mud~~ adjusting the pH of the acidic slurry to form the neutral zirconia sol, further comprising a step of drying the neutral zirconia sol to form a powder.

29. (original) The method according to claim 28, wherein vacuum concentrating or vaporizing method is performed for accomplishing the step of drying the neutral zirconia sol.

30. (Currently amended) The method according to claim 28, wherein after the step of drying the neutral zirconia sol to form the powder, further comprising a step of

Customer No.: 31561  
Docket No.: 10731-US-PA  
Application No.: 10/708,801

dispersing the powder into a solvent to obtain a transparent dispersion sol.

31. (original) The method according to claim 30, wherein the solvent is selected from one of water, a polar solvent and a mixed solvent thereof.

32. (original) The method according to claim 31, wherein the polar solvent comprises ethanol or ethylene glycol.